

Dublin San Ramon Services District
Parks RFTA Water Distribution System
Program:
Line Location, Leak Detection & Leak Repair

Section A-1 Urban Water Conservation Grant Application Cover Sheet

1. Applicant (Organization or affiliation): Dublin San Ramon Services District
2. Project Title: Parks RFTA Water Distribution System Program
3. Person authorized to sign and submit proposal:
- | | |
|------------------------|--|
| Name, Title | <u>Bert Michalczyk, General Manager</u> |
| Mailing address | <u>7051 Dublin Blvd., Dublin, CA 94568</u> |
| Telephone | <u>(925) 551-7230 x 106</u> |
| Fax | <u>(925) 829-1180</u> |
| E-mail | <u>michalcz@dsrsd.com</u> |
4. Contact person (if different):
- | | |
|------------------------|--|
| Name, Title | <u>Stan Kolodzie, Assistant Engineer</u> |
| Mailing address | <u>Same as above</u> |
| Telephone | <u>(925) 551-7230 x 107</u> |
| Fax | <u>(925) 829-1180</u> |
| E-mail | <u>kolodzie@dsrsd.com</u> |
5. Funds requested (dollar amount): \$259,900
6. Applicant funds pledged (local cost share) (dollar amount): none
7. Total project costs (dollar amount): \$259,900
8. Estimated net water savings (acre-feet/year): 225 AF/yr
- | | |
|--|-----------------|
| Estimated total amount of water to be saved (acre-feet): | <u>4500 AF</u> |
| Over <u>20</u> years: | <u>20 Years</u> |
| Benefit/cost ratio of project for applicant: | <u>1.96</u> |
| Estimated \$/acre-feet of water to be saved: | <u>\$548/AF</u> |
9. Project life (month/year to month/year): 10/2003 to 12/2023
10. State Assembly District where the project is to be conducted: Assembly District 15
11. State Senate District where the project is to be conducted: Senate District 7

12. Congressional District(s) where the project is to be conducted: District 10

13. County where the project is to be conducted: Alameda
County

14. Do the actions in this application involve physical changes in land use, or potential future changes in land use?

(a) Yes _____

(if yes, complete the land use check list at
http://www.calfed.water.ca.gov/adobe_pdf/Questionnaires_EC_Permits_Land_Use.pdf and submit it with the proposal

(b) No _____ X _____

A-2 Application Signature Page

By signing below, the official declares the following:

- The truthfulness of all representations in the application; and
- The individual signing the form is authorized to submit the application on behalf of the applicant; and
- The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the application on behalf of the applicant; and
- The applicant will comply with all terms and conditions identified in this Application Package if selected for funding.

Signature

Bert Michalczyk, Gen. Mgr.
Name and Title

Date

Section A-3 Application Checklist

Complete this checklist to confirm all sections of this application package have been completed.

Part A: Project Description, Organizational, Financial and Legal Information

- _____ A-1 Urban Water Conservation Grant Application Cover Sheet
- _____ A-2 Application Signature Page
- _____ A-3 Application Checklist
- _____ A-4 Description of project
- _____ A-5 Maps
- _____ A-6 Statement of work, schedule
- _____ A-7 Monitoring and evaluation
- _____ A-8 Qualification of applicant and cooperators
- _____ A-9 Innovation
- _____ A-10 Agency authority
- _____ A-11 Operation and maintenance (O&M)

Part B: Engineering and Hydrologic Feasibility (construction projects only)

- _____ B-1 Certification statement
- _____ B-2 Project reports and previous studies
- _____ B-3 Preliminary project plans and specifications
- _____ B-4 Construction inspection plan

Part C: Plan for Environmental Documentation and Permitting

- _____ C-1 CEQA/NEPA
- _____ C-2 Permits, easements, licenses, acquisitions, and certifications
- _____ C-3 Local land use plans
- _____ C-4 Applicable legal requirements

Part D: Need for Project and Community Involvement

- _____ D-1 Need for project
- _____ D-2 Outreach, community involvement, support, opposition

Part E: Water Use Efficiency Improvements and Other Benefits

- _____ E-1 Water use efficiency improvements
- _____ E-2 Other project benefits

Part F: Economic Justification, Benefits to Costs Analysis

- _____ F-1 Net water savings
- _____ F-2 Project budget and budget justification
- _____ F-3 Economic efficiency

Appendix: Benefit/Cost Analysis Tables

- _____ Tables 1; 2; 3; 4a, 4b, 4c, 4d; and 5

Section A-4 Description of Project

Dublin San Ramon Services District became the owner and operator of the Parks Reserve Force Training Area (Parks RFTA) potable water distribution system as part of the nationwide privatization process of Federal Installations in 1995. Acquisition of the facilities on Parks RFTA presents an opportunity to integrate the facilities into the current potable water distribution system of the District's network and to utilize the facilities that meet the standards of the District.

However there is a significant problem with incorporating the Parks RFTA water distribution system into DSRSD. The system was initially built at the same time as the first Sherman tanks. Neither the Shermans nor the distribution system are as modern as they need to be.

This program, which would become possible under an Urban Water Conservation Program grant, has three objectives:

1. Improve the Water Use Efficiency of the District in operating the Parks RFTA system by developing a complete information base of the system. Currently, the size, condition, location, material and connections of some of the distribution lines are unknown.
2. Identify currently undetected leaks in the system.
3. Repair the leaks identified above.

Leakage of the system is known to be a significant problem. Ninety-seven repairs of known leaks have been done since the start of year 2000. A similar number of undetected leaks is suspected. The District wants to begin a proactive program to find and repair these leaks before they appear at the surface. Step one of such program would be to find the pipes.

Ownership and maintenance of Parks RFTA has passed through the hands of three of the armed forces since it was built by the Seabees in 1942. Records and drawings are very scarce. DSRSD still does not have a firm understanding of the location of all the water lines and how they are connected. Lines and valves that are shown on the few existing drawings are sometimes absent and the valves are sometimes inoperable. Pressure problems sometimes occur at different parts of the base. When the District has attempted to improve the pressure conditions at those locations by increasing the overall system pressure, a flurry of leaks has been one result. This program would help the District to improve the water use efficiency of this distribution system by proactively locating all the lines, finding the leaks now undetected and repairing them.

The recommended program involves mapping and tracing all the potable water mains in the system, using a master meter to estimate the total leakage volume, using a leak correlator to identify and locate the leaks, and using routine leak repairs to stop them. The total cost of the requested grant is \$259,900 with the Total Annual Costs equal to \$25,663. Total Net Annual Water Supply Benefit is \$50,416. The Benefit/Cost Ratio is 1.96.

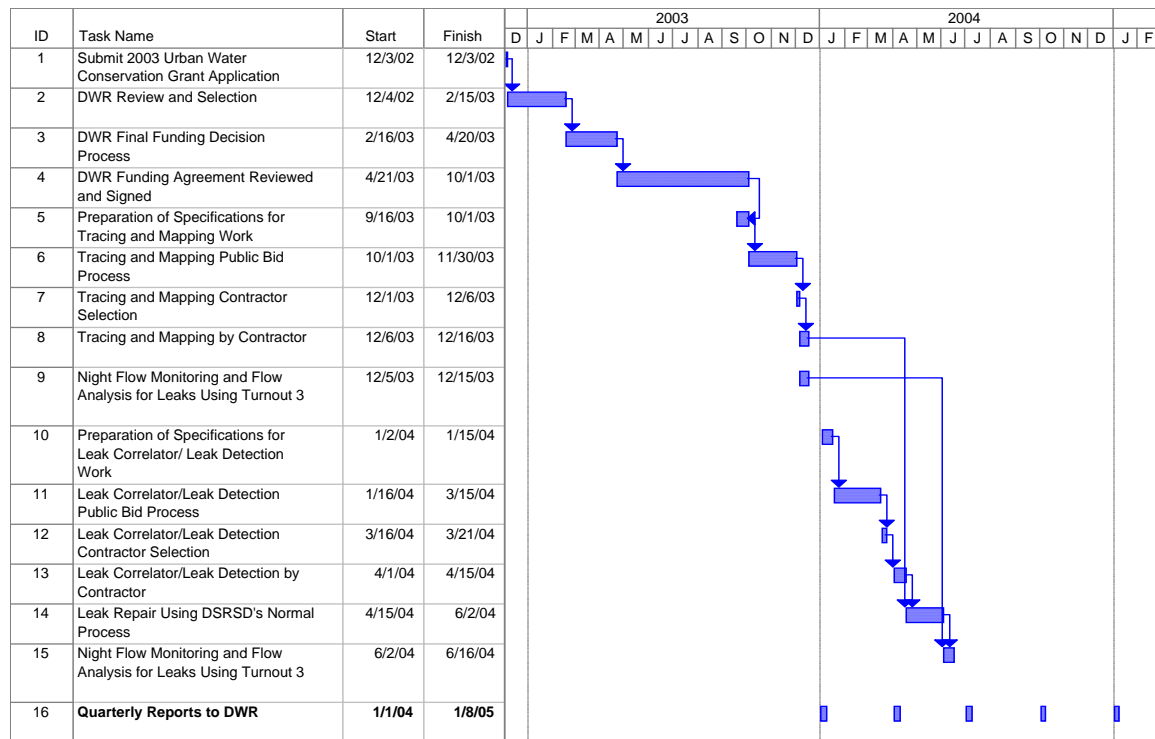
Section A-6 Statement of Work, Schedule

Project Plan and Task List for Parks RFTA Water Distribution System Program						
No.	Task	Start Date	End Date	Deliverable Item	Cost of Individual Task	Inseparable if Project only Partially Funded
1	Submit 2003 Urban Water Conservation Grant Application	12/03/02	12/03/02	Grant Application	\$0	X
2	DWR Review and Selection	12/04/02	02/15/03			
3	DWR Final Funding Decision Process	02/15/03	04/20/03			
4	DWR Funding Agreement Reviewed, Approved by Board and Signed	04/20/03	10/01/03	Signed Agreement	\$0	X
5	Preparation of Specifications for Tracing and Mapping Work	09/16/03	10/01/03	Specification Packet	\$5,000	X
6	Tracing and Mapping Public Bid Process	10/01/03	11/30/03	Bids by Contractor Candidates	\$0	X
7	Tracing and Mapping Contractor Selection	11/30/03	12/05/03	Responsible Low Bid Contractor	\$0	X
8	Tracing and Mapping by Contractor	12/05/03	12/15/03		\$40,000	X
9	Night Flow Monitoring and Flow Analysis for Leaks Using Turnout 3	12/05/03	12/15/00	Estimated Total Leak Volume	\$10,000	X
10	Preparation of Specifications for Leak Correlator/Leak Detection Work	01/01/04	01/15/04	Specification Packet	\$5,000	X
11	Leak Correlator/Leak Detection Public Bid Process	01/16/04	03/15/04	Bids by Contractor Candidates	\$0	X
12	Leak Correlator/Leak Detection Contractor Selection	03/16/04	03/21/04	Responsible Low Bid Contractor	\$0	X
13	Leak Correlator/Leak Detection by Contractor	04/01/04	04/15/04	List and Location of Detected Leaks	\$42,000	X
14	Leak Repair Using DSRSD's Normal Process	04/15/04	06/01/04	Elimination of Detected Leaks	\$114,000	X
15	Night Flow Monitoring and Flow Analysis for Leaks Using Turnout 3	06/01/04	06/15/04	Confirmation of Leak Elimination	\$10,000	X
16	Quarterly Project Reports to DWR on Increased Water Use Efficiency	01/01/04	12/31/05	Quarterly Program Reports	\$5,000	X
				Total	\$226,000	
				Contingency @ 15%	\$33,900	
					\$259,900	

Quarterly Expenditure Projection

Quarterly Expenditure Projection for Parks RFTA Water Distribution System Program								
Quarter	Estimated Expenditures Before Contingency Estimates							
	Planning, Design, Engineering	Materials and Installation	Equipment Purchases/ Rentals	Environmental Mitigation/ Enhancement	Construction, Administration, Overhead	Project Legal/License Fees	Other	Total
1/1/2003 - 3/31/2003								\$0
4/1/2003 - 6/30/2003								\$0
7/1/2003 - 9/30/2003	\$5,000							\$5,000
10/1/2003 - 12/31/2003	\$25,000		\$25,000					\$50,000
1/1/2004 - 3/31/2004	\$5,000							\$5,000
4/1/2004 - 6/30/2004	\$35,000	\$40,000	\$67,000	\$10,000	\$5,000	\$4,000		\$161,000
7/1/2004 - 9/30/2004	\$1,000							\$1,000
10/1/2004 - 12/31/2004	\$1,000							\$1,000
1/1/2005 - 3/31/2005	\$1,000							\$1,000
4/1/2005 - 6/30/2005	\$1,000							\$1,000
7/1/2005 - 9/30/2005	\$1,000							\$1,000
10/1/2005 - 12/31/2005								\$0
Totals	\$75,000	\$40,000	\$92,000	\$10,000	\$5,000	\$4,000	\$0	\$226,000

Parks RFTA Water Distribution System Program Schedule



Section A-7 Monitoring and Evaluation

This program has a built-in step to evaluate the effectiveness of the potable main repairs. At the conclusion of the repair program, a second round of late-night flow analyses will be done using the master meter at Turnout 3 on the boundary of the Parks RFTA system. The difference between the initial late-night flow before the repairs and the second after them will be a measure of the effectiveness of identifying and repairing the leaks in the system.

In future years, the master plan for operating the Parks RFTA distribution system calls for the installation of individual meters at barracks, office buildings, commissaries, dining facilities, sports grounds, etc. In all approximately sixty individual meters will be installed. However, the master meters now being used for billing Parks RFTA will remain in place. DSRSD engineering staff plans to periodically sum the individual meter consumption for a billing cycle to compare it to the master meters values. The comparison will reveal the extent of leakage in the water lines between the master meters and the individual meters.

Section A-8 Qualifications of the Applicant and Cooperators

David A. Requa
Assistant General Manager and Engineering Manager

Dublin San Ramon Services District
94568

7051 Dublin Boulevard • Dublin, CA

PROFESSIONAL INFORMATION

Education: Civil Engineering – University of California, Davis
Master of Science – June, 1971
Bachelor of Science – March, 1970
Emphasis in: Water, Wastewater and Solid Waste Management

University of California, Berkeley
Continuing Education in Public Administration

Registration: Professional Engineer California – C-24013

Associations: 1st Vice President – WaterReuse Association of California
Engineering Committee Water Reclamation Chair – California Water Environment Association
Desalination Committee – American Water Works Association
Water Reclamation Committee – Water Environment Federation
Member – American Public Works Association

EXPERIENCE

General:

- 16 years of professional engineering as an engineering consultant dealing with planning, design and construction of potable water, recycled water and wastewater facilities.
- 12 years of public utility management of potable water, recycled water and wastewater systems.

Water Recycling:

As a consultant for the City of Lodi, CA

- Responsible for the design and construction of the City's agricultural irrigation facilities expansion. All effluent from the 6.8 MGD secondary plant is utilized in the summertime on 800 acres of agricultural land owned and operated by the city.

As a consultant for the County of Sonoma, CA

- Responsible for planning for the use of secondary effluent for the irrigation of grapes.

As a consultant for the Sewerage Agency of Southern Marin, CA

- Planned facilities for the irrigation of a city park adjacent to the treatment plant.

As a consultant for the Las Vergnias Water District, CA

- Responsible for planning, design and construction of a 350 acre farm for the agricultural reuse of sludge. Facilities for irrigation with secondary effluent were also provided **Contra Costa Water District (CCWD)**
 - Oversaw the development of comprehensive water recycling master plan and business plan
 - Negotiated water supply contracts with the two wastewater agencies within the boundaries of CCWD.
 - Oversaw the planning, design and construction of a 1 MGD filter plant for the treatment of secondary effluent to meet unrestricted use requirements of the State of California
 - Oversaw the initiation of recycled water service to properties adjacent to the wastewater facilities.

Dublin San Ramon Services District (District)

- Responsible for the permitting, planning, design and construction of a 2.5 MGD microfiltration and reverse osmosis treatment facility to provide treatment plant effluent of high enough quality for recharge into the potable groundwater basin.
- Managed the development of a landscape irrigation master plan and obtained a permit for a microfiltration and ultraviolet light disinfection treatment system for Title 22 water.
- Managed the development and implementation of the District's recycled water enterprise, set to begin operation in the summer of 1999.

PUBLICATIONS

Requa, D. A. "Kinetics of Packed Bed Denitrification." Thesis – University of California, Davis. June 1970.

Kelly, J. M., Requa, D. A. "WateReuse – The California Direction." Water Environment Federation Annual Conference. Illinois. August 1994.

Requa, D. A., Wendell, D. "Clean Water Revival – Injection of Recycled Water into a Potable Groundwater Basin." Water Federation Annual Conference. Illinois. September 1997.

Arber, R. P., et al. Using Reclaimed Water to Augment Potable Water Resources. Water Environment Federation and American Water Works Association. 1998.

Ling, H., Requa, D. A., Wong, V. "The Livermore-Amador Valley Projects for Groundwater Recharge using Reverse Osmosis Treated Recycled Water." WateReuse Association Annual Conference. September 1998.

Crook, J., Requa, D. A. "Trials and Tribulations of Implementing an Indirect Potable Reuse Project: A Case Study." American Water Works Association Annual Conference. Illinois. July 1999.

| There are to be no external cooperators in this project.

Deleted: Please see the Appendices for the resume showing the Qualifications of the Project Manager.

Section A-9 Innovation

The Parks RFTA Water Distribution System Program is not in itself an innovative project. Other Districts have used master meters to estimate overall leakage from selected areas or used water correlators to identify and locate water leaks.

This recommended project actually is one of the tools being used to help a previous innovative program for increasing water use efficiency to succeed. That program which is already underway is the privatization of the Parks RFTA Utility systems, including the potable water system.

The partners in privatizing these utilities are the Federal government, led by the US Army and Dublin San Ramon Services District. With the privatization, both parties have achieved worthy goals and the state of California stands to gain as well from increasing the efficiency of water used in the area.

The Federal government has benefited from the agreement with DSRSD. The government has seen a steady increase in the reliability of the water supply network for Parks RFTA while recording a lowered unit cost for water supplied. The government has been able to use its resources focusing on the primary mission of Parks RFTA; which is train the Reserve Forces of the country; instead of diluting those resources on the maintenance of the base's utilities.

DSRSD has benefited from the agreement by joining this large network of water distribution facilities to those of the surrounding areas on the west, south and east. In particular, DSRSD has used an area of the base for a Field Services yard and the 3.3 million gallon reservoir for storage in the area.

The state of California has gained by having an established special services district bring engineering focus to the wasting of its water resource through leaks in this system. Past history of repairs and maintenance on the base has been less than what will be provided by DSRSD standards. Through the nearly four years of the agreement, DSRAD has brought a strong and continuing effort to reduce the volume of water lost through leakage on the base. That net savings in water in past and future years is water that would otherwise be lost to the underlying unusable aquifer underneath Parks RFTA.

It was the innovative privatization agreement that allowed the mutual benefits to accrue. DSRSD must now perform the "routine" maintenance work to allow the fruits of privatization to ripen. The requested grant would substantially help the innovative agreement generate the benefits to the two parties and the state of California continue for many years.

Section A-10 Agency Authority

1. The General Manager of the District has been directed to implement measures to reduce Unaccounted Water for the District by the Water Committee of the District Board of Directors. Implementation of this program and entering into a funding agreement with the DWR for this purpose would fall within the direction given to the general manager.

On December 9, 2002, a resolution to authorize entering this specific agreement with the Department of Water Resources will be presented to the Water Committee for recommendation to the full Board of Directors at the next Board of Directors meeting on December 17, 2002.

2. Dublin San Ramon Services District is a Community Services District formed and enabled under the Provisions of the State of California Government Code 61000.

3. Dublin San Ramon Services District is not required to hold an election before entering into a funding agreement with the State of California.

4. The funding agreement between Dublin San Ramon Services District and the State of California will not be subject to review or approval by any other government agencies.

5. There is no pending litigation that may impact the ability of Dublin San Ramon Services District to enter into this agreement with the State of California or to complete the proposed project.

Section A-11 Operations and Maintenance

Regular Operations and general maintenance of the District's water distribution network is done by District-employed Water Operators in the Field Services Department. The cost of these employees is shown below under "Personnel". Larger Scale repair projects are done by contractors selected by the Field Services Manager. The cost of these repairs is shown below under "Repairs & Maintenance: Water Infrastructure".

The source of revenue for these expenses is the Water Enterprise Fund of the District. This Fund is provided its revenue from the Water Consumption Fees paid by District customers in bi-monthly billing and by Connection Fees paid for new connections. The Water Enterprise Fund revenue from all sources for Fiscal Year 2003 is \$9,169,464.

Operations and Maintenance Expense Summary Field Services Department Water Enterprise Fund

Object	Estimated FY 2003 Expenses
Personnel	\$580,279
Chemicals	\$20,000
Operating Supplies	\$25,000
Utilities - Water	\$275,000
Gasoline, Oil & Fuel	\$8,000
Repairs & Maintenance: Water Infrastructure	\$380,000
Repairs & Maintenance: Water Equipment	\$20,000
Small Tools & Equipment: Water	\$25,000
Small Tools & Equipment: Portable Signs	\$800
Contracts: Professional Services: Water	\$10,000
Maintenance Contracts: Water	\$5,000
Other Contract Services: Water	\$15,000
Total	\$1,364,079

Part B—Engineering and Hydrologic Feasibility

Section B-1 Certification Statement

Parks RFTA Water Distribution System Program engineering feasibility certification statement

I, Dave R. Requa, a California registered civil engineer, have reviewed the information presented in support of this application. Based on this information, and any other knowledge I have regarding the proposed project, I find that it can be designed, constructed, and operated to accomplish the purpose for which it is planned. There is a sufficient water supply for the project. The information I have reviewed to document this statement is included in this grant application and in the DSRSD files.

(Original signature and stamp with expiration date)

Section B-2 Project Reports and Previous Studies

DSRSD first studied the situation in Parks RFTA in 1998 with the “Parks Reserve Forces Training Area Utilities Privatization Evaluation Revised Evaluation Report” from Whitley, Burchett and Associates. This study reviewed the condition of both water and wastewater utilities at Parks RFTA and the possible integration of the water facilities into DSRSD’s Pressure Zone 1. The “Summary” of “Chapter 3 Water Distribution System” is reproduced below:

The PRFTA water distribution service area is located within the District’s pressure Zone 1. The base serves elevations ranging from 330 to 420 feet and it currently maintains a minimum static pressure of 30 psi. The District’s pressure Zone 1 serves elevations ranging from 330 to 430 feet and also maintains a minimum static pressure of 30 psi. Because of the close proximity of the base and the fact that both entities currently buy water from the same source, Zone 7, integration of PRFTA into the District’s water distribution system is potentially feasible. Of concern is the elevation of the base’s reservoir, with a bottom elevation 33 feet higher and a water line elevation approximately 17 feet higher than the Dougherty Reservoir and Reservoir No. 1.

Major portions of the existing distribution system need to be replaced. While most of the piping is of adequate size to meet projected demands, its age and shallow construction have combined to make it subject to frequent failures and to low pressures throughout the system*(emphasis added)*. The largest single element of the recommended rehabilitation program is the 12-inch line constituting the main loop around the base. Nearly half the cost of the recommended program is associated with the line. The pipe between the reservoir and the FCI connection would have to be increased to 16 inches in diameter to meet the FCI’s fire demands. A pipe diameter of 16 inches extending to Dougherty is recommended for integration with the District to meet District’s fire flow demands. If the system is connected to the District’s, all of the base’s buildings will need to be metered.

From the chapter summarized above, Figure 3-2 Existing Water Distribution System Deficiencies is included at the end of this section. It notes areas with historically high frequencies of pipe breaks.

The Parks RFTA program addresses the condition of the piping emphasized above with the specific intention of reducing water losses to leakage from the lines.

WBA also completed a study in July 2002 “Parks RFTA Water System Operations Analysis”. This study also discussed the problem of integration of the Parks RFTA distribution system into the overall DSRSD pressure Zone 1 system operation. Upgrades of certain interconnections and the piping between the Parks RFTA pump station and the reservoir are recommended in this report.

The improvements recommended in these two reports will make the water losses from the leaks in the mains more critical. DSRSDS is striving to improve its

water use efficiency in Parks RFTA. That efficiency will be degraded if the leaks in the water distribution system are not addressed.

Copies of the two reports mentioned above are available on request.

Section B-3 Preliminary Project Plans and Specifications

A preliminary set of project plans for most of this project would be nearly impossible to present. The majority of the work spent on this project and expenses for the project will be for the repairs done to the water lines in Parks RFTA. However, until the water line tracing and mapping part of the project is done, DSRSD will not know where all the lines run in the project area. Also, until the leak detection and leak correlation part of the project is done, there is no means available to predict where the leaks are and the size, condition and depth of the lines involved. Also, the leaks will be repaired on a basis of using the current leak repair contractor to fit into the schedule of the operation of the base. For these reasons, more detailed project plans than those presented in Section A-4, "Description of the Project" and Section A-6 "Statement of Work, Schedule" are not presented.

The acceptable line repair material and techniques are specified in Dublin San Ramon Services District Standard Procedures, Specifications and Drawings.

Section B-4 Construction Inspection Plan

PRE-REPAIR INSPECTION DSRSD has an active repair program underway in Parks RFTA. The District's water operators and construction inspectors are already familiar with general ground conditions on the base and the requirements of base operation. Typically, a water operator or Field Services supervisor reviews the work site with the contractor before the repair contractor moves in equipment for a water line repair.

INSPECTION DURING WATER LINE REPAIR DSRSD construction inspectors will inspect each repair site as necessary during repair operations.

POST-REPAIR INSPECTION Typically, a water operator or Field Services supervisor inspects the work site and the repair construction with the contractor as the water line repair is being completed. DSRSD construction inspectors will inspect each repair site at the completion of repairs. Any defects in the repairs will be corrected by the contractor.

In addition, the District engineering staff will double check on the efficiency of the water line repairs by performing a flow test using the meter at Turnout No. 3 after all the repairs are completed. This flow test will compare the apparent water leakage volume with that apparent leakage volume found in the flow test run at the start of the program.

Section C-1 California Environmental Quality Act and National Environmental Policy Act

This program would be categorically exempt from CEQA provisions as noted below:

Article 19 Categorical Exemptions, Section 15301 Existing Facilities

"Class I consists of the operation, Repair, maintenance or minor alteration of existing public or private structures, facilities, mechanical equipment or topographical features involving negligible or no expansion of use beyond that previously existing...The key consideration is whether the project involves negligible or no expansion of an existing use, including, but not limited to... (b) Existing facilities of both investor and publicly-owned utilities used to provide electric power, natural gas, sewage, or other public utility services."

Section C-2 Permits, Easements, Licenses, Acquisitions and Certifications

No special permits or licenses are required for this project. The anticipate repairs are typical of those done by DSRSD on a routine basis.

Notification of the Security forces on the base for the engineers and technicians performing the flow monitoring and the leak detection during the early morning hours will be required. Parks RFTA is an active military base of the US Armed Forces. All persons entering the base are subject to security inspection. Testing and repair of the water distribution system would be subordinate to base operations in time of emergency.

Section C-3 Local Land Use Plans

This Parks RFTA Water Distribution System Program is consistent with the Objectives of the Dublin San Ramon Services District Water Master Plan 2000. By providing for more accurate understanding of the location and condition of the water lines in Parks RFTA and reducing the volumes of water lost through leakage of the system, the Program will help conserve the District's and the State of California's potable water resources.

Section C-4 Applicable Legal Requirements

Repair of District water mains is within the bounds of regular District operations and complies with State and District regulations.

The bidding and bid awards for the program will be done under regular District policy which meets all state regulations governing the bidding and awarding of public entity contracts.

Section D-1 Need for the Project

The original facilities in Parks RFTA were built in 1942 as quickly as possible to create an “instant” training base. The base has been managed by the Navy Seabees, the US Air Force and the US Army. Each of the services has maintained and operated the water facilities with an eye to expediency and minimizing the costs expended. Each of the services also maintained the water distribution system according to their own standards instead of the AWWA standards. Nearly every conceivable pipe material is in service in the system. Maintenance records prior to 1995 are sparse, as-built drawings are very rare. It is not surprising that there are multiple leaks in this distribution system. What is surprising is that it continues to function without major failures.

The streak of luck in operating the Parks RFTA water distribution system is likely to stop soon. It is important to efficient operation of the system to find where the water lines run and where they are now leaking.

DSRSD plans to integrate the Parks RFTA potable water facilities into DSRSD's Pressure Zone 1 potable water system in this decade. Development is occurring to the west, south and east of the Parks RFTA system. The deteriorated condition of the water distribution system on the base must be improved to prevent major problems with integrating the system into the rest of DSRSD's system.

Thirty-five repairs to the 15 miles of water line were done in Fiscal Year ending July 2000. Thirty-eight were done in FYE July 2001. Fourteen repairs were done in FYE July 2002. So far, ten have been required for this fiscal year. Each of these repairs was due to conditions found by subsidence or water flows to the surface. Some were in locations that were not thought to have pressurized water service. In other instances, valves thought to control sections of water main were found to control other sections or were found to be broken or partially throttling the water flow.

This project represents an opportunity to learn enough about the water distribution system to manage it intelligently instead of reactively.

This project would help bring the management of the Parks RFTA water distribution system up to the level of other parts of DSRSD's network. The project is consistent with the goals and recommendations of DSRSD's Water Master Plan of September 2000.

Section D-2 Outreach, Community Involvement, Support, Opposition

DSRSD's relationship with Parks RFTA is a unique one in that there is only one "customer" depending on 15 miles of water main under the customers property. In this case, the community to be involved is a community of one.

DSRSD has contacted the Department of Public Works at Parks RFTA and discussed the possibility of a grant to fund substantial repairs to the water distribution system. Parks RFTA has expressed support for the program of locating the water lines, detecting the hidden leaks and repairing them. For the years 2003 through 2006, this program would also bring a reduction in the water bill paid by Parks RFTA due to the current use of the Master Meters at the boundary of Parks RFTA for billing.

A letter from Parks RFTA stating their support of this program is included with this application.

Section E-1 Water Use Efficiency Improvements

Currently all the water leaking from the potable mains in Parks RFTA is lost to beneficial use. There are no groundwater wells within the base area because the ground water in this locale is very salty. All water saved from leaking in this project will thus increase the overall Water Use Efficiency of the District. This project should save approximately 225 AF of potable water every year. In 2001 the District purchased a total of 8817.7 AF of water from its supplier, Zone 7. Thus, this project will improve the water use efficiency of the District by over 2.5%.

Another, more indirect improvement in water use efficiency will come about from this program. At this time, the District does not have firm and certain knowledge of all the potable water mains in Parks RFTA. This problem was due to the lack of documentation from the installation of the facilities more than 50 years ago and the frequent changes in ownership among Federal agencies over the years. To identify the leaks in the mains, the entire 15-mile system will first be traced to locate exactly the water mains. Improving the knowledge and understanding of where the distribution system lies and how each segment ties to the next will improve the efficiency of the District in managing the water resource for Parks RFTA.

Section E-2 Other Project Benefits

Some of the water which leaks from the mains at Parks RFTA may enter the equally aged sanitary sewer system on the base in the form of infiltration. DSRSD processes the wastewater from Parks RFTA. All the infiltration prevented from entering the Parks RFTA sewer system will save the processing of that water. Currently, the DSRSD Wastewater Treatment Plant spends about \$4,050 treating each Acre-foot that enters the plant. If only 10% of the water leaking from the potable mains infiltrates into the sanitary sewer system, eliminating the leakage will prevent over \$90,000 in avoidable water treatment costs.

There is a definite dollars and cents expense of treating infiltration in the sanitary sewer system. For DSRSD there is also a burden on the environment. DSRSD's wastewater plant effluent is pumped to the East Bay Discharger's Authority, and out to San Francisco Bay. Preventing the infiltration of unnecessary water into the sanitary sewer system will prevent the discharge of an equivalent volume of treated water into San Francisco Bay.

An intangible benefit to the overall operation of Parks Reserve Force Training Area would be the ability to plan and schedule the repair of the leaks to correspond to lulls in the training schedule on the base. Currently, hidden leaks are discovered by truck traffic causing subsidence in the streets of the base. This requires an immediate response from the District to repair the leak causing the subsidence, and interrupts the traffic during busy training sessions at the base. Detecting and locating the leaks ahead of subsidence, and repairing them at lulls in training activities would reduce the disruption.

Section F-1 Net Water Savings

This project will result in the Net Savings to the overall California water resource of 225 AFA. This effect should last for the 20 year life of the repairs saving a total of 4500 AF over the life of the project.

The water that now leaks from the Parks RFTA mains percolates into the ground water basin underlying the area. However, the ground water in this localized area is of poor quality and is not generally usable. The poor quality of the groundwater reflects the geological conditions from many years ago. Apparently, this area was something akin to a salt flat with a high chlorides concentration. The resultant groundwater of today also has a high chlorides concentration. Water use in this area precludes the use of groundwater from this particular area of the groundwater basin. In 2001, DSRSD commissioned a Groundwater Study in this area which found:: "...native(i.e.) groundwater quality in the area is very poor (TDS>20,000 mg/L) reflecting the presence of a natural groundwater discharge area where salts tend to accumulate as discharge water evaporates."¹

Thus, the water which currently leaks from the potable water mains in Parks RFTA enters an unusable section of the groundwater aquifer. Stopping those leaks would create a net water savings of 225 AFA, or a total of 4500 AF over the expected 20 year life of the leak repairs.

¹ Investigation of Groundwater and Soil on the FSL and DLD Site, Pleasanton, California, *prepared by CH2M Hill*, September 2001

Section F-2 Project Budget and Budget Justification

Estimated Budget for Parks RFTA Water Distribution System Rx											
Item	Estimated Expenditures										
	Land Purchase/Easement	Planning, Design, Engineering	Materials and Installation	Structures	Equipment Purchases/Rentals	Environmental Mitigation/Enhancement	Construction, Administration, Overhead	Project Legal/License Fees	Other	Contingency Costs @ 15%	Total
Tracing and Mapping of Parks RFTA Potable Lines		\$15,000			\$25,000					\$6,000	\$46,000
Night Monitoring and Flow Analysis Using Turnout 3 Meter		\$10,000								\$1,500	\$11,500
Leak Correlator - Leak Detection and Pinpointing		\$20,000			\$22,000					\$6,300	\$48,300
Leak Repair		\$10,000	\$40,000		\$45,000	\$10,000	\$5,000	\$4,000		\$17,100	\$131,100
Night Monitoring and Flow Analysis Using Turnout 3 Meter		\$10,000								\$1,500	\$11,500
Net Water Savings Analysis, Economic Analysis		\$5,000								\$750	\$5,750
Quarterly Reports to DWR on Increased Water Use Efficiency		\$5,000								\$750	\$5,750
Totals	\$0	\$75,000	\$40,000	\$0	\$92,000	\$10,000	\$5,000	\$4,000	\$0	\$33,900	\$259,900

Section F-3 Economic Efficiency

The Economic Efficiency of this project is demonstrated by the Benefit to Cost Ratio of 1.96.

At the current time, the potable water delivered to Parks RFTA is metered through two master meters at the boundaries of Parks RFTA. Therefore at this time, the leakage from the water mains in Parks RFTA comes after the water is metered and DSRSD is now paid for the all the water enters the mains, including that which ultimately leaks out. However, the District will complete a Capital Improvement Project in 2006 that will eliminate the Master Meters on the boundary of Parks RFTA and replace them with a series of individual meters at all the service points inside the base. Every barracks, building and athletic field will have its own meters after 2006. These new meters will meter the water DOWNSTREAM of the leaks in the water mains. Thus, if the leaks are not corrected, DSRSD will lose the revenue of the leaking water now being determined at the master meters.

The Economic Efficiency values calculated in this application take the situation of the Master Meters into account. First, a project Benefit to Cost ratio was calculated using Tables 1-6 provided in the Water Use Efficiency Grant Application package assuming that all the water leaking was saved to contribute to DSRSD revenues(see the tables at the end of this section). Then the Project Benefits from the estimated leakage for years 2003 through 2006 is removed from the calculation in the following table to take into account the fact that during the first four years of the project economic benefits of the leak repairs will NOT accrue to DSRSD.

Calculation of Actual Time-Discounted Benefit to DSRSD						
Water saved is 225 AF per year. For years 2003 thru 2006 the leakage in the mains will flow through master meters and will be billed if the leaks are not repaired. For years 2007-2023 Parks RFTA will be billed through individual meters and the leakage in the mains would not be billed.						
Benefit = 225 AFA x \$548/AF = \$123,300						
		Annual Project Benefits	Discounting Factor, 6%/yr.	Total Time Discounted Benefits		Time Discounted Benefits thru Master Meters
1	2003	\$123,300	1.000	\$123,300		\$123,300
2	2004	\$123,300	0.940	\$115,902		\$115,902
3	2005	\$123,300	0.884	\$108,948		\$108,948
4	2006	\$123,300	0.831	\$102,411		\$102,411
5	2007	\$123,300	0.781	\$96,266		
6	2008	\$123,300	0.734	\$90,490		
7	2009	\$123,300	0.690	\$85,061		
8	2010	\$123,300	0.648	\$79,957		
9	2011	\$123,300	0.610	\$75,160		
10	2012	\$123,300	0.573	\$70,650		
11	2013	\$123,300	0.539	\$66,411		
12	2014	\$123,300	0.506	\$62,427		
13	2015	\$123,300	0.476	\$58,681		
14	2016	\$123,300	0.447	\$55,160		
15	2017	\$123,300	0.421	\$51,851		
16	2018	\$123,300	0.395	\$48,739		
17	2019	\$123,300	0.372	\$45,815		
18	2020	\$123,300	0.349	\$43,066		
19	2021	\$123,300	0.328	\$40,482		
20	2022	\$123,300	0.309	\$38,053		
Totals				\$1,458,832		\$450,561
Time Adjusted Benefits to DSRSD (Total less Master Meter)						\$1,008,271
Annualized (20 year) Time-Adjusted Benefits to DSRSD						\$50,413.54

From the table above, the Project Benefits are : \$50,413.53.

From Table 3, the Total Annual Costs are: \$25,663.

Thus, the Benefit /Cost Ratio is: 1.96.

The assumptions used in this analysis follow the pattern required in the instructions for the Grant Application.

Period of Analysis: The period of analysis is assumed to be 20 years, a reasonable life for well constructed pipeline repairs.

Inflation and Escalation: This analysis used the recommended factor of 0%.

Discount Rate: This analysis used the recommended factor of 6%.

Dollar Value Base Year: This analysis used the recommended current year.

Multiple Funded Project: This project is not a Multiple Funded one.

Project Costs: Included in Tables 1, 2 and 3 as recommended. Project costs come from the Project budget information included in a previous section.

Avoided Cost of Current Supply Source: This is the primary source of economic benefits to this project. 225 AFA of water will be saved, and in years 2007-2023, DSRSD will accrue revenue for this water if this program is implemented. This water would not be purchased from DSRSD's regular water supplier at the current rate of \$548/AF.

Alternate Cost of Future Supply Sources: If this project is not implemented, there would be no alternative source developed by the District. Zero cost was assigned to this factor.

Water Supply Vendability: No value is assigned to this factor in this program.

Tables 1 through 5 are shown on the following pages.

Applicant: DSRSD Parks RFTA Water Distribution System Program

THE TABLES ARE FORMATTED WITH FORMULAS: FILL IN THE SHADED AREAS ONLY

Table 1: Capital Costs

	Capital Cost Category (a)	Cost (b)	Contingency Percent (c)	Contingency \$ (d) (bxc)	Subtotal (e) (b+d)
(a)	Land Purchase/Easement	0	15.00%	0	0
(b)	Planning/Design/Engineering	70,000	15.00%	10,500	80,500
(c)	Materials/Installation	40,000	15.00%	6,000	46,000
(d)	Structures	0	15.00%	0	0
(e)	Equipment Purchases/Rentals	92,000	15.00%	13,800	105,800
(f)	Environmental Mitigation/Enhancement	10,000	15.00%	1,500	11,500
(g)	Construction/Administration/Overhead	10,000	15.00%	1,500	11,500
(h)	Project Legal/License Fees	4,000	15.00%	600	4,600
(i)	Other	0	1.00%	0	0
(j)	Total (1) (a + ... + i)				259,900
(k)	Capital Recovery Factor: Use Table 6				0.0872
(l)	Annual Capital Costs (j x k)				22,663

(1) Costs must match Project Budget prepared in Section F-2.

Applicant: DSRSD Parks RFTA Water Distribution System Program

Table 2: Annual Operations and Maintenance Costs

Administration (a)	Operations (b)	Maintenance (c)	Other (d)	Total (e)
1,000	1,000	1,000		3,000

Table 3: Total Annual Costs

Annual Capital Costs (1) (a)	Annual O&M Costs (2) (b)	Total Annual Costs (c) (a+b)
22,663	3,000	25,663

(1) From Table 1, line (l)

(2) From Table 2, column (e)

Applicant: DSRSD Parks RFTA Water Distribution System Program**Table 4: Water Supply Benefits
(2002 Dollars)****Net water savings (acre-feet / year) 225****4a. Avoided Costs of Current Supply Sources**

Sources of Supply (a)	Cost of Water (\$/AF) (b)	Annual Displaced Water Supply (AF) (c)	Annual Avoided Costs (\$) (d) (b x c)
Zone 7 Water Dist	548	225	123300
			0
			0
			0
			0
Total			123300

4b. Alternative Costs of Future Supply Sources

Future Supply Sources (a)	Total Capital Costs (\$) (b)	Capital Recovery Factor (1) (c)	Annual Capital Costs (\$) (d) (bxc)	Annual O&M Costs (\$) (e)	Total Annual Costs (\$) (f) (d+e)
	0	0.0872	0	0	0
			0		0
			0		0
			0		0
			0		0
Total					0

(1) Use number from Capital Recovery Factor Table 6

4c. Water Supplier Revenue (Vendability)

Parties Purchasing Project Supplies (a)	Amount of Water to be Sold (AF) (b)	Selling Price (\$/AF) (c)	Expected Frequency of Sales (1) (%) (d)	Expected Selling Price (\$/AF) (e) (cxd)	"Option" Fee (2) (\$/AF) (f)	Total Selling Price (\$/AF) (g) (e+f)	Annual Expected Water Sale Revenue (\$) (h) (b x g)
	0	823	100.00%	823	0	823	0
				0		0	0
				0		0	0
				0		0	0
				0		0	0
Total							0

(1) During the analysis period, what percentage of years are water sales expected to occur?

For example, if water will only be sold half of the years, enter 50% (0.5).

(2) "Option" fees are paid by a contracting agency to a selling agency to maintain the right of the contracting agency to buy water whenever needed. Although the water may not be purchased every year, the fee is usually paid every year.

Table 4d. Total Water Supply Benefits

(a) Annual Avoided Costs of Current Supply Sources from 4a, column (d)	123,300
(b) Annual Avoided Costs of Alternative Future Supply Sources from 4b, column (f)	0
(c) Annual Expected Water Sale Revenue from 4c, column (h)	0
(d) Total Net Annual Water Supply Benefit (\$) (a+b+c)	
	123,300

Table 5: Benefit/Cost Ratio

Project Benefits \$(1)	123,300
Project Costs \$(2)	25,663
Benefit/Cost Ratio	4.80

(1) From Table 4d, row (d): Total Annual Water Supply Benefits

(2) From Table 3. column (c): Total Annual Costs